APPENDIX B – AVIATION ACTIVITY FORECASTS

B-1 PURPOSE AND CONTEXT

As a part of the FAA's ongoing National Airspace Redesign (NAR) effort, the Midwest Airspace Plan (MAP) study is investigating various alternative designs for the air traffic routes and airspace in the St. Louis Metropolitan and surrounding areas. In order to thoroughly evaluate these alternatives and meet NEPA requirements it is necessary to conduct both operational and environmental modeling of the future baseline conditions as well as each alternative. A key element in the development of accurate modeling for these conditions is the forecasting of future air traffic operational levels expected in the area and at the airports of interest. Thus, a forecasting effort was undertaken to ensure that the most up-to-date estimates of future operational activity were used in the analysis.

The ultimate accuracy of any forecasting effort is affected by many factors. Some of these include quality and availability of data; distance into the future of the projections; and the stability of the item being forecast. To even the most casual observer, it is clear that the aviation industry has been in a state of flux since 2001. Consequently, it is valuable to start the process by looking at the current general state of the industry. The following subsections present a general summary of the context of the major elements of the aviation industry that relate to this effort.

B-1.1 Air Carrier Industry Context

Much has been observed in the latest round of industry contraction that affects national and local aviation demand including but not limited to:

- An overall capacity reduction in scheduled air service by mainline ("legacy") carriers;

- An overall expansion in scheduled air service by low cost/low fare carriers;

- A continuing shift or preference for regional jets over narrowbody aircraft in many markets;

- The re-negotiation of labor agreements by major carriers as part of extensive cost reduction strategies;

- The retirement of older and less fuel-efficient aircraft; and

- The continued reduction/consolidation of hubbing activities as evidenced by the American Airlines reductions at STL and Delta Airlines recent closure of their hub at Dallas-Ft. Worth.

B-1.2 Air Cargo Industry Context

Since airline deregulation, air cargo has expanded at about twice the rate of passenger activity. This robust growth is expected to continue over the forecast horizon. The growth and sustained profitability of the cargo integrators, most notably FedEx and United Parcel Services (UPS), has led the way. The Federal Aviation Administration (FAA) projects that the integrators will increase their market share of air freight from approximately 79 percent in 2002 to 88 percent by 2012. A number of factors that will continue to contribute to air cargo growth include:

- E-business and E-commerce;

- Increased use of regional hubs and regional trucking networks to accommodate demand;

- The U.S. Postal Service-FedEx alliance increases industry efficiency yet provides

FedEx with a significant competitive advantage vis-à-vis competing integrators; and

- The proliferation of regional jets by many mainline carriers reduces overall lift in many markets thereby increasing the amount of air freight hauled by the integrator carriers.

B-1.3 General Aviation Industry Context

The general aviation industry should be examined in a bisected manner in which analysts can study separately the leisure and corporate travel components of the general aviation marketplace. While the leisure market is expected to continue to decline in most markets, the corporate aviation market is rebounding in recent years as fractional ownership programs generate more affordable product lines for corporate travelers.

B-1.4 Military Industry Context

The war on terrorism has resulted in the occasional operation of combat air patrols in many major metropolitan areas. In addition, the war in Iraq has resulted in the deployment of air national guard tactical and strategic wings throughout the country.

The remaining sections of this report document the process and results of the operational forecasting effort undertaken for this study. The major data sources used in the effort are described along with the methodologies for the different types of facilities. The results of the effort are then compared to the FAA's Terminal Area Forecasts (TAF) at the conclusion of the report.

B-2 FORECAST METHODOLOGY

As mentioned in [Chapter 3, Affected Environment], the MAP study focuses on IFR flight planned air traffic arriving or departing five airports in the St. Louis Metropolitan Area. These airports include Lambert St. Louis International Airport (STL), Spirit of St. Louis

Airport (SUS), St. Louis Downtown Airport (CPS), St. Louis Regional Airport (ALN), and Scott AFB/Mid America Regional Airport (BLV). In addition to these airports, future air traffic forecasts for overflights of the study area were also prepared. All of these forecasts were prepared for the future years of interest; 2006 and 2013.

The forecasting effort culminated in the development of detailed operational schedules for each of the study airports for each future year. Because the operational modeling (airspace simulation) and the environmental modeling (noise modeling) focus on different issues, they require different operational scenarios for their analysis. In order to ensure that a given airspace/route design is sufficiently robust to accommodate a typical busy day of traffic, the airspace simulation effort analyzes the 90th-percentile (90-P) day, or 37th busiest day of traffic at the facility of interest. Similarly, the FAA requires noise analysis to be based on the average annual day (AAD) of operations in the year of interest. This forecasting effort provides both an AAD and a 90-P schedule for each airport of interest in the study area.

Factors Affecting Aviation Demand

Despite recent setbacks with the reduction of the American Airlines hubbing operation at STL, aviation traffic in the St. Louis area is expected to grow. A number of general assumptions and factors affecting demand were considered in the forecast exercise including, but not limited to, the following:

- **Regional Jets** – Among the most pronounced changes in commercial passenger fleets in recent years has been the replacement of turboprop aircraft with regional jets. The growth in regional jet traffic has primarily been limited by the ability of the manufacturers to produce sufficient new aircraft to meet demand. The continued growth in regional jet use is expected to drive an increase in the average seating configuration of regional airline

markets. Regional jets are also being used to replace narrowbody equipment.

- **Aviation Security** - Passenger confidence in enhanced aviation security is expected to return and the lethal events of September 11, 2001 are not expected to be a recurring event.

- **U.S. Economy** - The U.S. economy began to recover in the second half of 2003, although this recovery has been slower than with previous recessions.

- **Long-term Economic Indicators** - A basic assumption inherent in any forecast of aviation demand is the overall condition of the U.S. and world economies. Most economists foresee long-term and continued economic stability, reasonable consumer confidence, as well as growth in disposable personal income. All are positive influences on future air travel growth at STL.

- **Airline Yield** – It is assumed that airline yield will continue to decline on a constant dollar basis as projected by the FAA. The latest FAA aviation forecast predicts an annual decrease in real yield (inflation adjusted) between 2003 and 2020. Yield is the revenue per flight mile received by the airlines for carrying each passenger. Since deregulation, the decline in real yield has accelerated, so that by 2001 real yield fell to 13.94 cents, an average yearly decline of 2.1 percent from 1978.

- **Adaptation of Air Carriers in a New Aviation Economy** - U.S. airlines experienced strong profits in the late 1990s, and 2000 was one of the airlines' best years in history. In 2001 however, the U.S. major airlines collectively lost over $7 billion, even after a governmental infusion of about $4 billion. Due to the combined effects of the current economic recession and the events of September 11, 2001, many in the industry see more than just the swings of a cyclical business. Low fare carriers now account for nearly 20 percent of domestic air capacity, up from six percent in the early

1990s. Southwest has surpassed Northwest, Continental, and US Airways in terms of revenue passenger miles flown domestically. Increasing low fare carrier market share is assumed over the forecast horizon.

As part of this long-range forecast task, it is assumed that the underlying demand-drivers that have expanded and sustained aviation demand, including demographic and economic metrics, will continue to remain valid predictors of scheduled air service within the context of the recent changes at STL.

B-2.1 Sources of Data

The forecast development relied on a wide range of information about STL, the St. Louis area, the aviation industry, and the U.S. economy. Data was obtained from the following sources:

- **Woods & Poole, 1990-2015** – Socio-economic data including population, per capita income, employment, and earnings were provided by Woods & Poole. Woods & Poole is an independent vendor and nationally recognized firm that provides expert economic and demographic analysis.

- **Official Airline Guide (OAG)** – Scheduled airline service, historical aircraft, seat configurations, frequency, and Origin and Destination (O&D) city-pairs (among other metrics) were collected and analyzed. For each airport with scheduled airline service from STL, a 10-year city-pair add-drop matrix was developed. An add-drop matrix illustrates how air carriers at a particular station provide a predictable pattern of air service, depending on whether that station is a hub or a spoke market. The add-drop matrix informs the analysts about future new city-pairs and frequencies going forward. In addition, the OAG data provides key aircraft gauge (i.e. aircraft size) trends.

- **U.S. Department of Transportation (DOT) 10% Passenger Ticket Survey (O&D Data) Schedule T-100, 1990-2003** – Passenger O&D data provide a wealth of airline specific data for all domestic STL

markets. The T-100 data provides load factor and fare information. These historical measures provide important clues into how air carriers may sustain, expand, or reduce air service in select airport markets at STL going forward.

- **Terminal Area Forecasts (TAF), 2003-2020** – The most recent March 2004 TAF was downloaded from the FAA website. In addition, the airline yield trends and projections necessary for the demand forecast were provided by the FAA.

- **J.P. Fleets, 2001-2002** – Projected airline aircraft orders and options were provided by J.P. Fleets, a vendor that specializes in providing this data. Fleet forecasts provide insight into gauge assumptions and aircraft engine types.

- **Airframe Manufacturers Forecast, 2000** – Boeing, Airbus, and Bombardier all provide their own forecasts of aircraft, passengers, and revenue passenger miles. These reports were examined for comparability purposes.

- **Internet** – A good deal of data was collected from various internet sites mostly relating to corporate aviation and fractional ownership companies.

- **Airport Statistics** – Data were requested from selected airports on annual operations and passengers, as well as connecting rates and other airline statistics.

- **Enhanced Traffic Management System (ETMS)** – ETMS data provides a record of IFR flight planned traffic active in the National Airspace System. It is a combination of information by many sources including FAA radar systems. A four-month seasonal sampling (5/02, 7/02, 10/02, and 2/03) of ETMS data for traffic at the five MAP study airports and overflights transiting the MAP study area was acquired to support the forecast analysis.

B-3 ANNUAL FORECASTS

Annual operations and aircraft fleet mix information were compiled for each of the 5 airports based on previous studies, the FAA Terminal Area Forecasts (TAF), interviews with airport staff, and independent analysis. In some cases for smaller airports, the TAF had not undergone a recent update. Consequently, previous studies, consultation with APO, airport staff, and independent analysis were the primary elements of the forecast development.

B-3.1 Lambert-St. Louis International Airport

At the onset of the EA study in May of 2003, Landrum and Brown initiated an independent review, analysis, and development of future forecasts for each of the study airports. It was expected that this analysis, through typical coordination with FAA and other stakeholders, would ultimately become the foundation of the MAP EA technical analysis and modeling. Unfortunately, during the summer of 2003, American Airlines announced significant operational reductions at their Hub in St. Louis. This announcement, in conjunction with the general health of the airline industry and the continuing economic downturn, presented the potential for a significant change in future expectations for air traffic at STL. Consequently, it was determined that additional coordination between the FAA Central Region, the environmental team, STL staff, and FAA's office of Aviation Policy and Plans (APO) was warranted. The APO office develops policies, goals and priorities, forecasts future aviation technology and demands (TAF); and analyzes the economic impact of regulations. Ultimately, through a series of meetings and telecons, a consensus was reached with FAA APO regarding the future forecasts to be included in the FAA's TAF. This consensus was based on a combination of Landrum & Brown's analysis, analysis by the STL staff and their consultants, and FAA APO analysis.

Table B-1 presents a summary of the operational forecasts identified by FAA's APO

for use in the TAF. It should be noted that the numbers in the table reflect expected operational levels on a calendar year basis. FAA's published TAF utilizes the FAA's fiscal year (October-September) rather than a calendar year.

TABLE B-1 FAA TAF FORECAST – STL AIRCRAFT OPERATIONS

Calendar Year	Air Carrier	Cargo	Commuter	International	Air Taxi	GA	Military	Total
2000	332,134	7,140	103,024	7,736	7,403	23,415	4,084	484,936
2001	317,175	6,072	116,600	7,578	7,076	20,772	4,116	479,389
2002	263,389	3,992	131,103	6,102	9,607	25,809	2,552	442,554
2003(E)	189,388	4,383	150,828	5,472	9,800	25,546	2,344	387,760
2004	113,663	4,488	151,875	2,122	9,996	25,801	2,350	310,295
2005	126,594	4,596	157,593	2,153	10,195	26,059	2,350	329,541
2006	129,137	4,706	159,744	2,184	10,399	26,320	2,350	334,841
2007	131,403	4,819	160,347	2,216	10,607	26,583	2,350	338,326
2008	133,950	4,935	160,766	2,249	10,819	26,849	2,350	341,918
2009	136,710	5,054	161,445	2,282	11,036	27,118	2,350	345,994
2010	139,591	5,175	162,263	2,315	11,257	27,389	2,350	350,339
2011	142,404	5,299	163,003	2,349	11,482	27,663	2,350	354,550
2012	145,070	5,426	163,577	2,384	11,711	27,939	2,350	358,458
2013	147,623	5,556	164,030	2,419	11,946	28,219	2,350	362,143

(E) = Estimated
Source: FAA APO-110, October 1, 2003

The TAF operational forecasts were then analyzed in conjunction with passenger enplanement forecasts, historic operational data, airline aircraft orders, and other information to develop a future fleet mix for STL. **Table B-2** presents the forecast fleet mix for 2006 and 2013 for commercial, general aviation, and military operations. As the table indicates it is expected that the majority of commercial service in the future at STL will be provided by narrow body jet aircraft, primarily in the B-737 family. Regional Jet service will represent the second largest share of the commercial traffic, while propeller aircraft service is expected to continually decline throughout the forecast horizon. Few changes are expected in the general aviation and military fleet at STL through 2013.

Category	Aircraft (NIRS Type)	2006	2013	Category	Aircraft (NIRS Type)	2006	2013
TABLE B-2 FORECAST FLEET MIX - STL							
Commercial				**General Aviation**			
Jet	717200	2.2%	2.7%	Jet	737400	4.0%	3.7%
	737300	7.8%	7.9%		727EM2	8.1%	7.4%
	737700	29.6%	31.87%		CL600	21.2%	21.3%
	727EM2	0.5%	0.5%		CNA500	2.0%	1.9%
	A319	1.5%	1.9%		FAL20	6.1%	5.6%
	A320	0.9%	1.1%		GIIB	2.0%	1.9%
	BAE146	1.0%	0.00%		GIV	3.0%	3.7%
	CL600	4.4%	2.9%		LEAR25	2.0%	1.9%
	CL601(RJ)	24.9%	29.9%		LEAR35	7.1%	9.3%
	DC1030	0.4%	0.5%		MU3001	8.1%	7.4%
	DC870	0.2%	0.2%	Prop	BEC58P	20.2%	20.4%
	DC95HW	0.2%	0.34%		CNA441	8.1%	8.3%
	EMB145 (RJ)	7.9%	10.5%		GASEPF	4.0%	3.7%
	GV (RJ)	3.1%	2.5%		GASEPV	4.0%	3.7%
	MD83	4.4%	3.7%	Total		100.0%	100.0%
Prop	DHC6	3.1%	0.2%	**Military**			
	DHC8	3.2%	1.6%	Jet	F15A	100.0%	100.0%
	DHC830	0.7%	1.6%				
	SF340	3.8%	0.1%				
Total		100.0%	100.0%				

(RJ) = Regional Jet

B-3.2 Satellite Airports

Forecasts of instrument operations for the four main reliever airports (SUS, CPS, ALN, and BLV) were also developed as part of this effort. The following points summarize the general assumptions and methodology employed in this effort.

- Commercial and air taxi traffic will remain based at Lambert-St. Louis.

- Analysis included daily instrument operation totals for the year 2002 from FAA APO historical data (except BLV). From this data, the average annual day and 90th percentile day operations were calculated.

- For Scott Air Force Base/Mid-America Airport and overflights, four months (one month from each season) of Enhanced Traffic Management System (ETMS) radar data was analyzed to determine average annual day and 90th percentile day operations.

- ETMS radar data was also utilized for all Study Area Airports to determine the existing fleet mix and hourly distributions for both arrival and departure operations.

- Airport managers were interviewed to determine the current airport users and anticipated growth at the airport.

- Satellite airport future growth rates were calculated based on historical growth rates

for instrument operations for the years 1998 through 2002.

- Arrival and departure hourly distributions were grown proportionally with the assumption that there would be no outside forces affecting and changing the current hourly operational profiles.

- Existing fleet mix characteristics were evaluated and determined to be accurate assessments of future fleet mix characteristics thus holding the fleet mix constant in future years.

Spirit of St. Louis Airport

Forecasts of instrument operations at SUS were developed based on the assumptions and methods outlined above. The analysis identified an expected annual growth rate of 0.4% throughout the forecast horizon. Generally, this growth is expected to be driven by the overall increase in general aviation traffic in the St. Louis area during the coming decade. The growth rate is further supported in the historic trends of instrument operations at SUS from 1998 to 2002. **Table B-3** presents a summary of the instrument operations forecast for SUS. The table also provides a comparison to FAA's TAF data.

Table B-4 presents the forecast aircraft fleet mix for SUS. As the table indicates, the fleet mix at SUS is expected to remain relatively stable throughout the forecast horizon. While there will be relatively minor fluctuation between aircraft within a category, the mix of jets and props will is expected to remain at about the 60%/40% split that is currently evident at the airport.

TABLE B-3 OPERATIONS FORECAST AND TAF COMPARISON – SUS				
Calendar Year	Annual Instrument Operations	Annual Forecast Growth Rate	FAA TAF Instrument Operations	Forecast Variation from TAF
2002	53,655	-	-	N/A
2006	54,519	0.4%	52,316	4.2%
2013	56,064	0.4%	56,703	-1.1%

Source: Landrum & Brown Analysis-2003; FAA TAF, January, 2004

TABLE B-4 FORECAST FLEET MIX - SUS			
Category	Aircraft (NIRS Type)	2006	2013
General Aviation			
Jet	CL600	17.9%	17.2%
	CNA500	2.8%	2.6%
	FAL20	2.8%	2.6%
	GIV	0.7%	1.3%
	LEAR25	1.4%	1.3%
	LEAR35	20.0%	19.2%
	MU3001	14.1%	14.9%
Prop	BEC58P	10.6%	11.5%
	CNA172	2.8%	2.9%
	CNA441	11.0%	10.6%
	DHC6	1.4%	1.3%
	GASEPF	1.4%	1.3%
	GASEPV	13.3%	13.2%
Total		100.00%	100.00%

Source: Landrum & Brown Analysis, 2003

St. Louis Downtown Airport

Table B-5 presents a summary of the instrument operations forecast for CPS. The analysis identified an expected annual growth rate of 3.9% throughout the forecast horizon. A large part of this growth is driven by the expected future growth in flight training associated with St. Louis University. The growth rate is also supported by the historic trends of instrument operations at CPS from 1998 to 2002.

Table B-6 presents the forecast aircraft fleet mix for CPS. The future fleet mix at CPS is expected to remain relatively stable throughout the forecast horizon with propeller aircraft continuing to represent about 77% if the instrument operations. This is commensurate with the expectation of continued growth in aviation flight training at St. Louis University.

TABLE B-5 OPERATIONS FORECAST AND TAF COMPARISON - CPS				
Calendar Year	Annual Instrument Operations	Annual Forecast Growth Rate	FAA TAF Instrument Operations	Forecast Variation from TAF
2002	22,630	-	-	N/A
2006	26,372	3.9%	23,270	13.3%
2013	34,471	3.9%	25,475	35.3%

Source: Landrum & Brown Analysis-2003, FAA TAF, January, 2004

TABLE B-6 FORECAST FLEET MIX - CPS			
Category	Aircraft (NIRS Type)	2006	2013
General Aviation			
Jets	CL600	5.0%	5.4%
	CNA500	2.6%	2.1%
	FAL20	2.6%	2.1%
	LEAR35	7.9%	10.3%
	MU3001	4.6%	3.6%
Props	BEC58P	24.7%	24.4%
	CNA172	1.3%	1.7%
	CNA441	11.9%	12.4%
	DHC6	2.6%	2.1%
	GASEPV	36.6%	36.1%
Total		100.00%	100.00%

Source: Landrum & Brown Analysis, 2003

MidAmerica / Scott Air Force Base

The Air Traffic Control Tower services at BLV are provided by the U.S. Air Force. Consequently, FAA APO does not track a historic database of instrument operations for the facility. Overall operational counts and some traffic mix data is supplied to FAA and presented in the FAA's TAF. To assist in the forecasting of instrument operations, 12 months of detailed tower count data (including instrument operations counts) were provided by Air Force Base Operations staff. This data was used in conjunction with the ETMS data sample to identify a generalized relationship between instrument operations and total operations at BLV.

Table B-7 presents a summary of the instrument operations forecast for BLV. The analysis identified an expected annual growth rate of 0.4% throughout the forecast horizon. This modest growth is driven by the expected future growth in general aviation traffic in the St. Louis area, as well as the historic trends of operations at BLV from 1998 to 2002. While the TAF does not forecast instrument operations at BLV, a comparison of the total annual operations forecast to the TAF reveals that the study forecast levels in both 2006 and 2013 vary from the TAF by about 6-7%.

Table B-8 presents the forecast aircraft fleet mix for BLV. The future fleet at BLV is expected to remain constant throughout the forecast horizon with military traffic representing some 80% of the instrument operations.

TABLE B-7 OPERATIONS FORECAST AND TAF COMPARISON - BLV				
Calendar Year	Annual Instrument Operations	Annual Forecast Growth Rate	FAA TAF Instrument Operations	Forecast Variation from TAF
2002	10,585	-	-	N/A
2006	10,755	0.4%	0	N/A
2013	11,060	0.4%	0	N/A

Source: Landrum & Brown Analysis-2003, FAA TAF, January, 2004

TABLE B-8 FORECAST FLEET MIX - BLV			
Category	Aircraft (NIRS Type)	2006	2013
General Aviation			
Jet	CL600	20.0%	20.0%
	LEAR25	20.0%	20.0%
	MU3001	20.0%	20.0%
Prop	CNA441	20.0%	20.0%
	GASEPV	20.0%	20.0%
	GA Total	100.0%	100.0%
Military			
Jet	707QN	17.4%	20.8%
	DC9Q9	39.1%	33.3%
	KC135R	4.4%	4.2%
	LEAR35	39.1%	37.5%
Prop	C130	0.0%	4.2%
	MIL Total	100.00%	100.00%

Source: Landrum & Brown Analysis, 2003

St. Louis Regional Airport

Table B-9 presents a summary of the instrument operations forecast for ALN. The forecast analysis resulted in an expected annual growth rate of 3.3% throughout the forecast horizon. This expectation is driven by the significant amount of flight training at the airport in conjunction with the presence of two FAR Part 135 operators (charter) on the field. The growth rate is also supported by the historic trends of instrument operations at ALN from 1998 to 2002.

Table B-10 presents the forecast aircraft fleet mix for ALN. The future fleet mix at ALN is expected to remain relatively stable throughout the forecast horizon with propeller aircraft continuing to represent about 70% if the instrument operations. This is driven by the significant flight training activity at ALN.

Table B-9 Operations Forecast and TAF Comparison - ALN				
Calendar Year	Annual Instrument Operations	Annual Forecast Growth Rate	FAA TAF Instrument Operations	Forecast Variation from TAF
2002	13,870	-	-	N/A
2006	15,793	3.3%	13,601	16.1%
2013	19,823	3.3%	14,136	40.2%

Source: Landrum & Brown Analysis-2003, FAA TAF, January, 2004

Table B-10 Forecast Fleet Mix - ALN			
Category	Aircraft (NIRS Type)	2006	2013
General Aviation			
Jet	CL600	5.2%	9.1%
	CNA500	4.7%	3.8%
	FAL20	4.7%	3.8%
	LEAR35	4.7%	3.8%
	MU3001	9.5%	11.4%
Prop	BEC58P	19.0%	18.9%
	CNA172	11.8%	13.3%
	CNA441	19.0%	18.9%
	GASEPF	2.4%	3.8%
	GASEPV	19.0%	13.3%
Total		100.00%	100.00%

Source: Landrum & Brown Analysis, 2003

B-3.3 Overflights

In support of the MAP environmental modeling effort, overflight traffic forecasts were developed for the future years of interest. This effort focused on IFR aircraft traffic that traverses the MAP study area below an altitude of 18,000 ft MSL and does not depart or arrive at one of the MAP study airports.

The overflight forecast was primarily based on a 4-month sample of ETMS data crossing the MAP study area during various seasons in 2002 and 2003. This data was analyzed to determine the average daily volume of overflights in the sample. This volume was assumed to be representative of the average annual day overflight traffic level. The FAA's national forecasts for aviation traffic were then analyzed to identify expected growth rates in each category of overflight activity. **Table B-11** presents a summary of the resulting overflight forecasts along with the annual growth rates for each category of traffic.

Using the 4-month ETMS overflight traffic sample, a representative fleet mix was determined for each category of overflight traffic. This fleet mix is expected to generally remain constant throughout the forecast horizon. Table B-12 presents a summary of the forecast overflight fleet mix for each of the future years of interest.

TABLE B-11 OPERATIONS FORECAST – OVERFLIGHTS (BELOW 18,000' MSL)								
	Annual Overflights				Annual Growth Rates			
Calendar Year	Commercial	General Aviation	Military	Total	Commercial	General Aviation	Military	**Total**
2002	38,690	71,175	1,095	110,960	-	-	-	-
2006	41,610	77,015	1,095	119,720	2.4%	1.0%	0.0%	1.7%
2013	49,640	85,410	1,095	136,145	2.5%	1.5%	0.0%	1.9%

Source: Landrum & Brown Analysis-2003, FAA Aerospace Forecast Fiscal Years 2003 - 2014

TABLE B-12 FORECAST FLEET MIX – OVERFLIGHTS (BELOW 18,000' MSL)							
Category	Aircraft (NIRS Type)	2006	2013	Category	Aircraft (NIRS Type)	2006	2013
Commercial				**General Aviation**			
Jet	737300	0.9%	0.0%	Jet	CL600	3.3%	3.0%
	737700	1.8%	2.2%		CNA500	2.4%	2.6%
	767300	1.8%	1.5%		FAL20	2.4%	2.6%
	727EM2	5.3%	5.1%		GIV	0.5%	0.4%
	757PW	2.6%	2.9%		LEAR25	1.4%	1.3%
	A320	1.8%	1.5%		LEAR35	4.7%	4.7%
	CL600	2.6%	2.2%		MU3001	4.3%	4.3%
	CL601	8.8%	10.3%	Prop	BEC58P	25.6%	25.6%
	DC1030	1.8%	2.2%		CNA172	2.8%	3.0%
	DC93LW	6.1%	5.9%		CNA441	16.1%	16.2%
	DC95HW	1.8%	1.5%		DHC6	4.3%	4.3%
	EMB145	1.8%	1.5%		GASEPF	2.4%	2.1%
	FAL20	0.9%	1.5%		GASEPV	29.9%	29.9%
	LEAR25	0.9%	0.0%		GA Total	100.0%	100.0%
	LEAR35	2.6%	2.9%	**Military**			
	MD83	0.9%	1.5%	Jet	F4C	66.7%	66.7%
	MU3001	1.8%	2.2%	Prop	C130	33.3%	33.3%
Prop	BEC58P	2.6%	2.2%		MIL Total	100.0%	100.0%
	C130	0.9%	0.7%				
	CNA441	4.4%	4.4%				
	CVR580	0.9%	0.7%				
	DHC6	3.5%	3.7%				
	GASEPF	7.0%	6.6%				
	GASEPV	2.6%	3.7%				
	HS748A	7.9%	6.6%				
	SD330	0.9%	1.5%				
	SF340	25.4%	25.0%				
	Com. Total	100.0%	100.0%				

Source: Landrum & Brown Analysis, 2003

B-3.4 Forecast Summary

Table B-13 presents a summary of the annual 2006 and 2013 aircraft operations forecasts for each of the five study airports in the MAP study area and overflights. The MAP study area is projected to experience 562,000 instrument flight operations in 2006, increasing by 10% over seven years to some 620,000 in 2013.

TABLE B-13 MAP ANNUAL INSTRUMENT OPERATIONS FORECAST SUMMARY			
	Actual	Forecast	
Facility	2002	2006	2013
Lambert-St. Louis International Airport - STL	442,554	334,841	362,143
Spirit of St. Louis Airport - SUS	53,655	54,519	56,064
St. Louis Downtown Airport - CPS	22,630	26,372	34,471
MidAmerica Airport/Scott AFB - BLV	10,585	10,755	11,060
St. Louis Regional Airport - ALN	13,870	15,793	19,823
Overflights	110,960	119,720	136,145
Total	654,254	562,000	619,706

B-4 DESIGN DAY FORECASTS

As outlined in Section 2 of this report, the operational modeling and environmental modeling for the MAP study each required a different type of daily flight schedule. In order to ensure that a given airspace/route design is sufficiently robust to accommodate a typical busy day of traffic, the airspace simulation effort analyzes the 90th-percentile (90-P) day, or 37th busiest day of traffic at the facility of interest. Similarly, the FAA requires noise analysis to be based on the average annual day (AAD) of operations in the year of interest. Thus, both an AAD and a 90-P schedules were developed for each airport of interest in the study area.

B-4.1 90th Percentile Day

The number of operations in the 2006 and 2013 90 percent day schedules for STL were calculated based on the ratio of annual to design day operations for the CY 2002 traffic STL. Due to the predominance of scheduled activity at STL, this ratio is expected to generally remain stable throughout the forecast period. For the satellite airports the forecast of the 90th percentile day traffic was developed by applying annual growth rates to the actual CY 2002 90-P day at each airport. **Table B-14** presents a summary of the 90-P day operations forecast for each airport.

TABLE B-14 MAP 90TH PERCENTILE DAY OPERATIONS FORECAST SUMMARY						
	2002 Actual		2006 Forecast		2013 Forecast	
Facility	AAD	90-P	AAD	90-P	AAD	90-P
Lambert-St. Louis International Airport - STL	1,212	1,474	917	1,015	992	1,113
Spirit of St. Louis Airport - SUS	147	199	149	199	154	199
St. Louis Downtown Airport - CPS	62	94	72	107	94	135
MidAmerica Airport/Scott AFB - BLV	29	44	29	45	30	45
St. Louis Regional Airport - ALN	38	60	43	67	54	81
Overlfights	304	408	328	418	373	460
Total	1,792	2,279	1,540	1,851	1,698	2,033

Source: Landrum & Brown Analysis, 2003

B-4.2 Design Day Flight Schedules

Profiles of 24-hour scheduled and unscheduled operations were developed for the five MAP study airports for 2006 and 2013. The profiles of operations are daily flight schedules that reflect the estimated instrument traffic associated with the forecast 2006 and 2013 levels of activity at these airports. A four month sample of ETMS data was used as a base for the creation of the future schedules. In addition, the ETMS data was supplemented with Official Airline Guide (OAG) data, Air Traffic Control Tower (ATCT) daily activity reports, and interviews with staff at the airports as necessary.

Lambert-St. Louis International Airport

The recent announcement by American Airlines regarding a significant reduction in hubbing operations at STL indicated that it would not be effective to develop hourly traffic profiles based on historic trends. Thus, the ETMS data sample was not adequate to assist in the analysis of Air Carrier and Commuter traffic schedule profiles at STL. To determine the hourly profiles of traffic in these categories, the Official Airline Guide (OAG) schedule for February 12, 2004 was used. The resulting hourly profile was then grown proportionately to determine the hourly distributions for the different years and activity levels in each category.

For the air cargo, military, and general aviation traffic at STL, it was assumed that there would be no outside forces effecting long-term changes in the operational profiles of these categories. Consequently, the four month ETMS data sample was used to determine arrival and departure hourly distributions for this traffic. The existing hourly distributions were identified and then adjusted proportionately based on the forecasts for the future years.

Once the hourly distributions for each traffic category were established, an analysis of historical Origin and Destination (O&D) data for STL was used in conjunction with the forecast fleet mix to determine the traffic schedule to each city-pair. **Exhibit B-1** presents a comparison of the forecast hourly traffic levels for the AAD in each future year of interest. A similar profile was developed for the 90-P day.
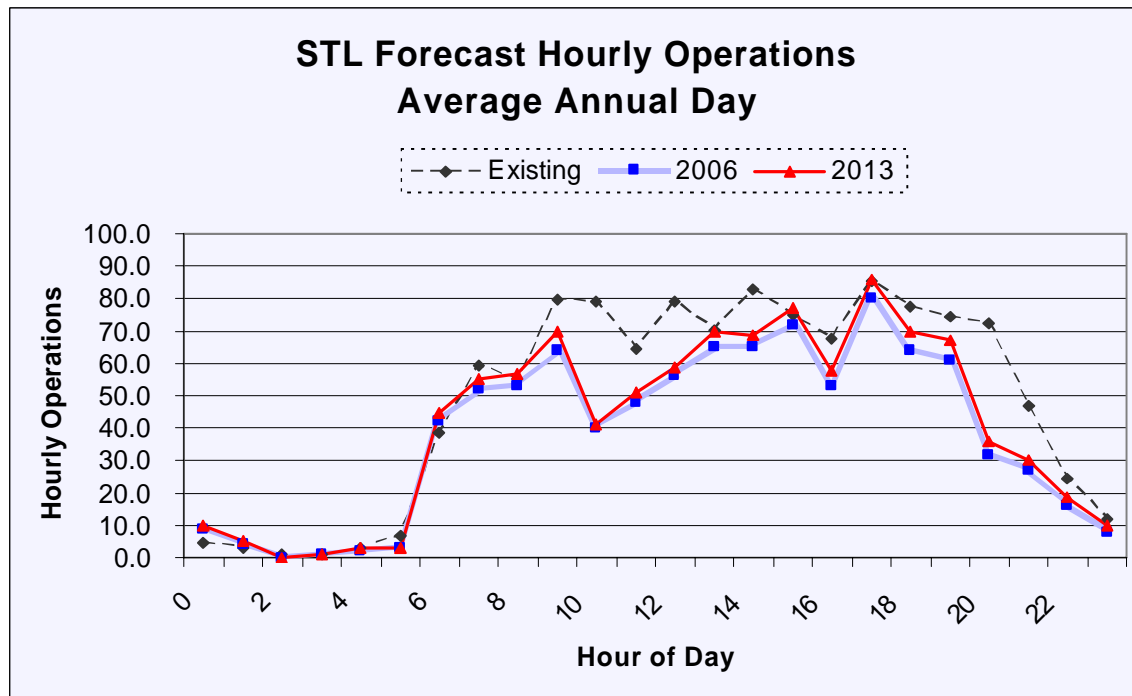
Exhibit B-1

The analysis described above was conducted for both the AAD and 90-P traffic levels. The resulting schedule of daily traffic was then provided in tabular form for input to the operational modeling and noise modeling efforts.

Satellite Airports

The methodology for developing the hourly traffic profiles and design day flight schedules for the satellite airports was the same as described above for the STL general aviation traffic. The ETMS data sample was used to determine arrival and departure hourly distributions for each airport and the existing hourly distributions were grown proportionately for each of the future years. Once the hourly distributions for each traffic category were established, the ETMS data sample was then used to develop an O&D city-pair analysis for each airport. This data was then used in conjunction with the forecast fleet mix to determine the traffic schedule to each city-pair. **Exhibits B-2** through **Exhibit B-5** present a
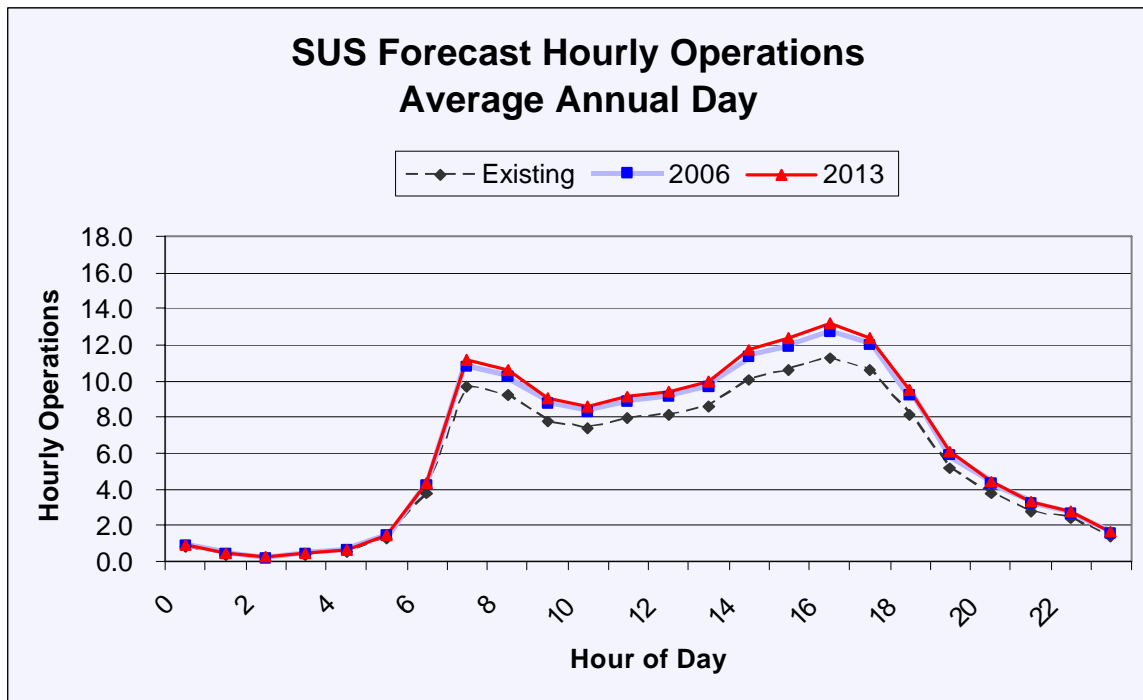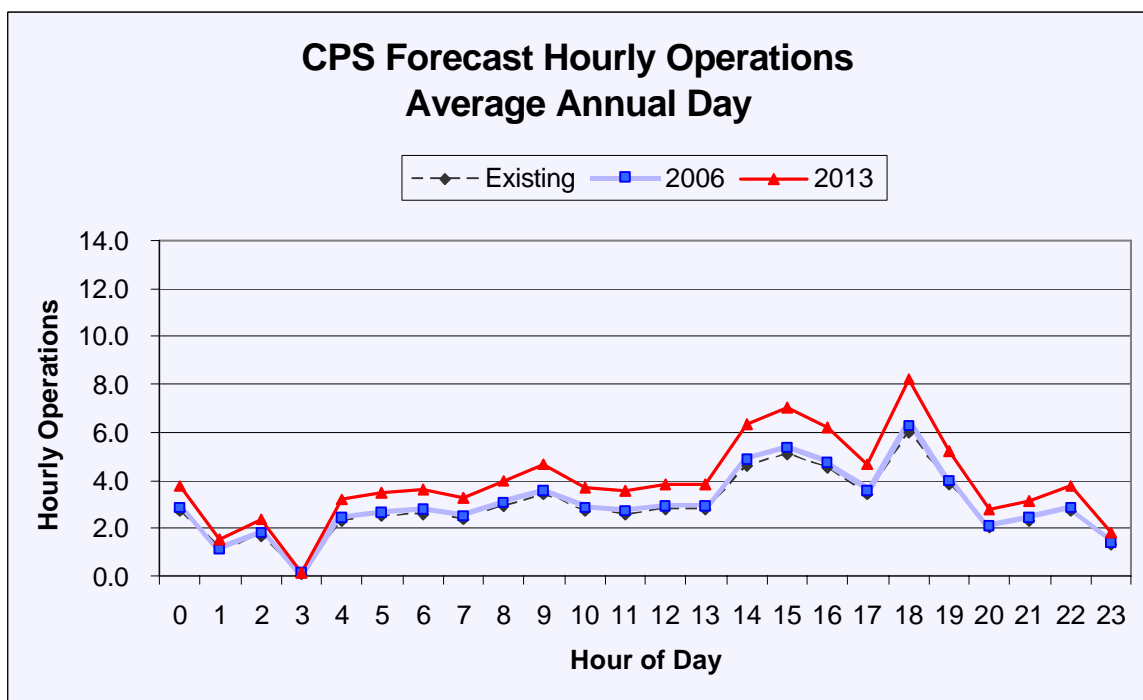
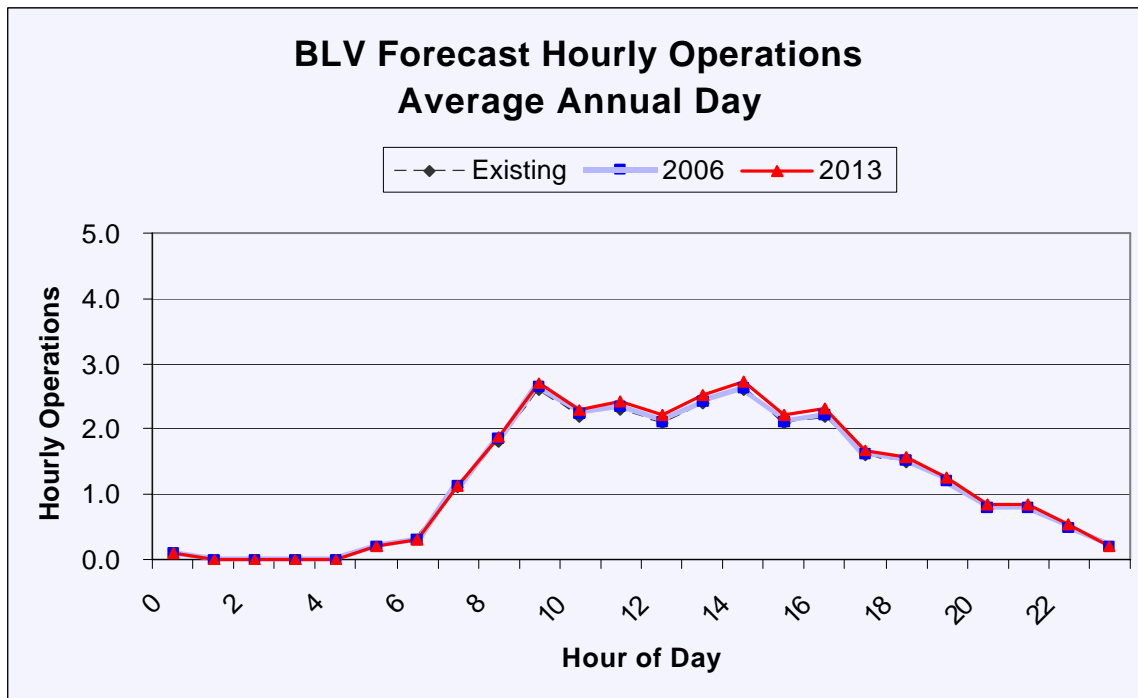comparison of the forecast hourly traffic levels for the AAD for each of the satellite airports.

SUS Forecast Hourly Operations Average Annual Day

Exhibit B-2

CPS Forecast Hourly Operations Average Annual Day

Exhibit B-3

BLV Forecast Hourly Operations
Average Annual Day

Exhibit B-4

ALN Forecast Hourly Operations
Average Annual Day

Exhibit B-5